

## **UNDERSTANDING CHILDREN'S CONSTRUCTION OF KNOWLEDGE: PROCESSES AND APPROACHES**

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### **ABSTRACT**

The significance of understanding children's construction of knowledge emanates from the ideological position on the nature of learning, which is the constructivist view. This, in turn, has deep connotations for the conceptualisation of learners' assessment. The present study attempts to explore the processes and approaches by which the learners attempt the given tasks. The study has a qualitative research design. The sample consisted of fifty children from Classes II and IV. Data was collected through a questionnaire which related to the broad areas of understanding of issues of Environment Studies (a subject taught in the primary school curriculum). The findings reveal that children come up with multiple and diverse responses, based on their own experiences of which they are a part. The findings have implications for both learners and teachers at the primary school level.

Thus paper puts forth the point that children entering primary school at around 5–6 years of age are already in the process of learning. So rich experiences provided to them at school need to acknowledge and build on what they already 'know'. This also has significant connotation on how assessment of children is conceptualised. Drawing from field-based evidences, the paper argues for a re-definition of the notion of assessment to be understood as more dynamic and process-oriented, which values each learner as 'special' and worthwhile. Finally, the educational implications of the findings are discussed.

**KEYWORDS:** Achievement, Assessment, Constructivist View, Environment Studies

### **INTRODUCTION**

The thrust of policy and practice in India is beginning to shift from mere schooling to learning. The recently released Annual Status of Education Report (ASER), 2013 shows that school education, particularly in rural India is a mixed bag of improving parameters like enrolment, but declining learning outcomes among children. These results come in contrast to the robust National Achievement Survey of NCERT released just a week earlier. In basic reading and numeracy skills, the majority of our school children fall behind, where they should be, based on their age and class. Thus, many of the schools seem to be failing in their basic mission of teaching.

Some studies/researchers conducted in India such as by Pratham (an NGO) have revealed clear lessons that it is the teaching at the right level – classroom instruction based on the actual learning level of the child rather than the rigid syllabus that helps to improve student achievement. The twelfth five year plan of Government of India also strongly emphasises 'improving learning outcomes at all levels' and talks of a need to design specialised programmes to achieve this goal. Thus, only those programmes would effective which are designed based on hard evidence.

The teaching-learning processes, in turn, hinge upon the curricular insights and planning ability of the teacher, on

one hand and on the enactment of learning experiences and their assessment on the other. In fact, the differences in the results revealed by the ASER and the NCERT compel us to re-visit our notion and strategies of assessment. At the outset, it has to be understood that children's entering primary school at around 5 – 6 years of age are already in the process of learning since they have had experiences of family life, friendship and community life, which have begun to shape and guide their intellectual and social development. For evolving a suitable curriculum for them, this entry into primary school must be based on providing new and rich experiences for learning which should acknowledge and build on what children have already learned, about 'themselves' and their 'world'. Even according to the National Curriculum Framework (NCF) 2005, children should be perceived as intellectually active learners already holding ideas or schemata which they use to make sense of their everyday experiences. This ideological position on the nature of learning is the constructivist view which purports that children actively make sense of the world by constructing meanings. Now, all this has significant connotations for the process of achievement, since, it is how assessment is conceptualised, operationalised or put into practice, that will ultimately determine how the learner emerges.

The very concept of assessment has in recent times undergone a very significant evolution. From being interpreted normatively, reflected in the notions of measurement, testing and evaluation, it has been re-defined and re-conceptualised as a much more process – oriented and dynamic concept (Gallagher, 1993). This has been complemented by a changed perception in the theory and practice of education as well, which now values every learner as a worthwhile dignified, unique being and an individual, warranting facilitation and feedback in his/her schooling. There is a realisation that traditional urban models of assessment adopted by formal schools have severe limitations in providing facilitative feedback to learners. Further, the homogenising experiences which they tend to promote, not recognising individual differences across learners which are imminent, especially emanating from their socio-cultural backgrounds, have also been questioned.

In the purview of Universalisation of Elementary Education (UEE), children from the rural context and from urban dis-advantaged communities and locales, have become very significant learner groups that need to be addressed.

It is in this context that the present study was undertaken. In this study assessment has been conceptualised as a process which is developmental, non-judgemental, places every individual child in his/her own subjective world or frame of reference, tracking how the child has evolved. It rests on the notion of the whole child, which takes into account social-learning and co-cognitive learning as fundamental to the child's identity and education.

## METHOD

This study has tried to assess learning in context, locate the mode of assessment in the simple naturally occurring learning experiences of children and using a different measure to assess them. In this light, a set of contextual tasks and situations were developed guided by the curriculum and the principles implicit in the NCF 2005. The broad aim of the study conducted as a part of PESLE Assessment (2007) by the author, was to gain an insight into children's thinking processes which facilitate knowledge construction. This aim was broken further to include these objectives:

- To understand the processes and approaches by which the learner attempts the given tasks.
- To understand his/her areas of strengths and gaps
- To develop insights about teaching-learning processes adopted in the sample schools.

## Development and Construction of the Tools

The tool was designed not with the focus on assessing the learners but to be a means to understand the processes adopted by them in constructing knowledge. The tool consisted of individual tasks related to broad areas of Environmental Studies which included their natural, physical, biological and socio-cultural world. The fifty children belonged to ten rural and semi-urban schools of north India. Class II and class IV children were taken for the study. The class II children were assessed orally while the written mode (paper-pencil) was used for class IV children.

## ANALYSIS AND INTERPRETATION OF DATA

The questions posed to individual learners were based on gauging how children relate to the world and how they make sense of it and understand it. Thus, it involved the working of certain 'cognitive' processes like observation, attention, thinking, reasoning and memory.

For each child, the responses to each question related to the task were recorded and categories formed on its basis. These are presented below:

- **Q.1. Why do Animals have a Tail?**

The responses generated by children are the following :*To get rid of flies; It is an animal and all animals have tails; To wag it; It is of use to them; To hide their 'organs' ; To get rid of dirt; To run; To fly' To do mischief and play*

Many children, both in class II and IV, seem to have applied logical reasoning and responded that dog is an animal and all animals have tails. Some children have responded by saying its use is to get rid of flies. This indicates that by this stage a rudimentary understanding of the structure-function relationship — a significant concept in Biology and EVS, has also evolved among children.

- **Q.2 Why do We Eat?**

The following major categories of responses have emerged: *Feel hungry; To stay alive; To get strength; To fill stomach; To stay healthy*. A few children have given the following responses: *To grow up; Can work hard; Will not faint*.

It appears that children have developed the concept of energy – a higher order concept. A majority of children in class IV responded by saying that we eat and energy is released. Thus, children seem to have gone beyond the mechanical connotation of the term 'energy' as strength to its metabolic meaning. Knowledge of a higher order concept, thus, is, seen to be existing among some children of class IV.

- **Q.3 Why do Mothers Beat?**

It is interesting to note that major categories have emerged as reasons given by children (of class II) for mothers beating them.

**Obedience:** Many children say that mothers beat because *'we do not listen to them or do errands for them, like, bringing water'*.

**Mischief:** Children perceive that mothers beat them when they do not work, or study, always play and do not go to school.

Thus, it appears that, children at this stage, have developed the concept of obedience and of what is good / bad, desirable / undesirable.

The third major category of responses obtained was taking bath, doing wrong, abusing someone, fighting with others, dirtying the place or asking for money.

Form the above, it appears that class II children also have an understanding of the concept of dirty/clean and of right / wrong. Among class IV children, the majority has responded by giving 'mischief' or 'something bad/wrong' as a reason. Asking for money and stealing are some other responses given by children as reasons for their mother beating them. This can be understood by relating the thinking of class IV children to their developmental level. They are all at pre-adolescent stage, which is the beginning of development of morality among children.

- **Q.4 Why do Fathers Get Angry?**

The categories of responses are : *Do not listen to him; Do mischief; Don't go to school; Do not work; Do wrong; Play with dirty children; When mother beats younger siblings; Do not study; Always play; Does not get angry; Ask for money; Fight with siblings*

The reasons given by children for fathers being angry are largely similar to those given for mothers beating them, such as, not listening to him (disobedience), doing mischief, not going to school/work, playing with dirty children. In addition some children of class IV also respond that their fathers get angry when mothers beat their young siblings. It appears that children's perception in class IV has moved away from seeing everything in relation to self to seeing relationships among others as well.

- **Q.5 Where does Water Come from?**

The following responses emerged: *From ground/well/boring/motor/electricity; On opening tap; From rain; From tank; Through the pipe; From inside; From bucket*

Some children have given the following responses: *From ground/ well/ boring/motor (electricity), it comes on opening the tap; from rain, tank, pump.* Some children have given one of the following responses: *from the pipe, river, pond and sea.* It is not surprising to find that the children's responses do not vary based on their rural/urban context. Today, signs of development are visible in several rural areas, which use modern techniques of procuring water, such as motor/electricity.

All this reveals that children are keen observers and have a fairly good understanding of phenomena around them.

- **Q.6 Where does the Sun go at Night?**

The responses obtained are : *Inside the clouds; Behind mountains;* Besides children have also responded by saying *it goes to South, to America, to sleep; or that it goes inside, in the sky, in the water, goes somewhere, goes up, goes to God, inside earth, goes in dark, or in a corner.*

The responses to this question reveal that children are still at a stage when true scientific knowledge has not been formed. Based on their own thinking, children have, however, developed an alternative framework of scientific concepts. In class IV, only some children responded by saying that the sun stays where it is and it is the rotation of the earth which is significant.



- **Q.7 Why do Human Beings Die?**

The reasons given by children are: *Diseases ; Get sick; Get old; Accident; Drink poison; Fights (with weapons); Fall in well; Do not eat; God calls them; Suicide, Snake bites, Eaten by animals, Drinking, Fall from roof, Paralysis*

In this case, the reasons given by children for human beings to die can be grouped into two major categories – scientific / biological and religious. However, a majority of children have based their responses on their observations and experiential learning when they say that people die of sickness/disease, accidents, poison or drinking. Old age and arrival of the time of death are other reasons cited. 'Breathing stops' is perceived a sign of death by these children. 'A call from God' has also been brought in as a reason for death by children.

- **Q.8 Why are Trees Green?**

This has been understood by children in two respects:

- Being plants and having leaves which are green, makes them living. Thus it is natural for them to be green.
- This question is also understood by children as to how trees 'continue' to be green - here they respond by listing factors affecting the growth of plants such as water, humus, (fertile soil), light and even oxygen. This shows the emergence of diverse thought processes among children.

## FINDINGS AND DISCUSSIONS

As seen from the above responses, the analysis of data obtained from the questionnaire has interesting revelations. It is found that as compared to class II children, the responses of children of class IV appear to be more uniform and structured– with more number of children giving similar responses. This can, perhaps, be explained in the context of learning at school, which, of course is not divorced from things related to everyday life of children – be it a city, a small town or village. Most questions pertained to important sustaining elements of a village / city life (land, water, air) or about significant people in the life of children (e.g. mother, father). Thus, the responses of children reveal that they have begun to understand the interdependence among nature and human life. Children have used their skills of observation, their ability to identify cause – effect relationships, their experiential learning or their learned understanding of objects and phenomena to judge. Children have also been guided by what they have heard or by their own intuitive understanding of phenomena. In case of class IV where the mode of conduction of tasks was a paper-pencil one, it is found that many children, did not feel at ease while writing. Thus their writing skills are rather poorly developed. Therefore, they had problems in cases where the responses required detailed descriptions e.g. in the question probing why mothers beat. However, these children could respond to most questions that involved giving single / few words e.g. Question '*Where does water come from?*'; Answer: '*From tank*'.

It can be concluded that the oral skills of children are better developed than writing skills.

## CONCLUSIONS

The findings of this research study have significant implications for Education. Firstly, as is evident, there is a need to understand children's processes of construction of knowledge. This calls for a need to shift from teachers' stereotyped expectations of pupils' learning in different subjects, that is, a single 'correct' answer cannot be emphasised by them. Children can come up with multiple and diverse responses, all of which need to be reflected and addressed by the

teacher. And hence, the study has demonstrated how means of assessment which take this into account, need to be accordingly designed and used.

The need is, thus, to be engaged in meaningful assessment of our learners by using approaches that are culture responsive and child created. They have to be compatible with a constructivist view of learners where children are seen as active constructors of knowledge, engaged in thinking and not just acquiring skills. Therefore, children's ability to regulate their own thinking and bring their indigenous knowledge to school needs, to be given due space in the school curriculum.

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